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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/823,312	04/13/2004	Min-Su Yeo	4001-19	4742

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DUANE MORRIS, LLP  
IP DEPARTMENT  
30 SOUTH 17TH STREET  
PHILADELPHIA, PA 19103-4196

EXAMINER
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SWERDLOW, DANIEL

ART UNIT	PAPER NUMBER
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2615

MAIL DATE	DELIVERY MODE
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07/18/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/823,312	YEO, MIN-SU	
	<b>Examiner</b>	<b>Art Unit</b>	
	Daniel Swerdlow	2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 13 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>5/14/04</u>   | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. **Claims 1,2, 4, 6 through 8, 11 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin (US Patent 4,979,219) in view of Lin (US Patent 4,811,816) and further in view of Andert et al. (US Patent 4,949,387).**

3. Regarding Claim 1, Lin '219 discloses a piezoelectric speaker (Fig. 3; column 2, line 67- column 3, line 24) comprising: a circular frame 40 that corresponds to the body claimed and includes a midplate 47 that corresponds to the bottom portion claimed and a circular sidewall 46, the midplate 47 that corresponds to the bottom portion claimed having a throttle hole 42 in its center and a wavy upper surface (i.e., a curve contour) from the throttle hole 42 to the sidewall 46; a reflection cover 44, located over and spaced from the circular frame 40 that corresponds to the body claimed and having a tip 440 at a lower center and inner surface (i.e., lower plane) having wavy contours 442 from the tip to the periphery of the reflection cover; the reflection cover being mounted (i.e., fixed) on the inner side wall 461 of the circular frame 40 that corresponds to the body claimed; a cover 53 and circular sidewall 531 that together correspond to the lower cover claimed with the cover 53 corresponding to the plate-shaped bottom portion claimed, the sidewall 531 corresponding to the sidewall claimed and press-fit (i.e., connected) to the circular frame 40 that corresponds to the body claimed; and a piezoelectric element 50 that

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corresponds to the piezoelectric transducer claimed between the circular frame 40 that corresponds to the body claimed and the cover 53 and circular sidewall 531 that together correspond to the lower cover claimed including a copper (i.e., metal) disc 51 and a ceramic disc 52 that corresponds to the piezoelectric element claimed. Therefore, Lin '219 anticipates all elements of Claim 1 except wires connected to the metal disc and the piezoelectric element and a passing hole in the metal disc. Lin '816 discloses a piezoelectric loudspeaker (Fig. 3) with wires 73 connected to a vibration diaphragm 71 and plate 72 that correspond to the metal disc and the piezoelectric element claimed (column 3, lines 28-30). Lin '816 further discloses that such an arrangement provides driving signals to the device (column 3, lines 48-52). It would have been obvious to one skilled in the art at the time of the invention to apply wire connections as taught by Lin '816 to the piezoelectric speaker taught by Lin '219 for the purpose of driving the device to produce sound. Andert discloses a piezoelectric loudspeaker (Fig. 1) with a channel 7 (i.e., passing hole) in the transducer plate 4 that corresponds to the metal disc claimed (column 2 lines 44-47). Andert further discloses that such an arrangement provides a versatile multi-purpose transducer (column 1, lines 31-34) capable of exhibiting a smooth and level frequency response (column 1, lines 61-63; column 2, lines 51-53). It would have been obvious to one skilled to apply the channel taught by Andert to the combination made obvious by Lin '219 and Lin '816 for the purpose of realizing the aforesaid advantages.

4. Regarding Claim 2, Lin '219 further discloses the contours 442 of the wavy inner surface of the reflection cover 44 being staggered with respect to (i.e., corresponding to) the contours 471 of the opposing surface of the midplate 47 that corresponds to the bottom portion claimed (column 3, lines 21-24).

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5. Regarding Claim 4, Lin '219 further discloses the copper disc 51 that corresponds to the metal disc claimed is a disc (i.e., is circular) (column 3, lines 7-10).

6. Regarding Claim 6, Andert further discloses the channel 7 that corresponds to the passing hole claimed located between the periphery of the plate 4 and the periphery of the piezoelectric layer 5 (Fig. 1).

7. Regarding Claim 7, Andert does not disclose expressly the channel 7 that corresponds to the passing hole claimed having a diameter in the range claimed. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to use a passing hole with a diameter of about 4 to about 6.5 mm. Applicant has not disclosed that a passing hole claimed having a diameter of about 4 to about 6.5 mm. provides an advantage, is used for a particular purpose, or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected applicant's invention to perform equally well with a hole sized as depicted in Fig. 1 in Andert because the hole size depicted in Andert results in good sound reproduction. Therefore, it would have been obvious to one of ordinary skill in the art to modify the hole size disclosed in Andert to obtain the invention claimed.

8. Regarding Claim 8, Lin '219 further discloses the ceramic disc 52 that corresponds to the piezoelectric element claimed is a disc (i.e., is circular) (column 3, lines 7-10).

9. Regarding Claim 11, Lin '219 further discloses the ceramic disc 52 that corresponds to the piezoelectric element claimed is ceramic (column 3, lines 7-10).

10. Regarding Claim 18, Lin '219 further discloses a bottom outer wall portion of the midplate that corresponds to the case claimed and surrounds the lower part of the midplate and the cover 53.

**11. Claims 3 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin '219 in view of Lin '816 and further in view of Andert and further in view of Pipitone et al. (US Patent 4,063,049).**

12. Regarding Claims 3 and 19, as shown above apropos of Claim 1, the combination of Lin '219, Lin '816 and Andert makes obvious all elements except connection by ultrasonic fusion or epoxy resin molding. Pipitone discloses a piezoelectric electroacoustic transducer (Fig.) with structural components (1, 2, 3) connected by ultrasonic welding (i.e., fusion) (column 2, lines 15-19). Pipitone further discloses that such an arrangement expedites manufacturing (column 2, lines 1-5). It would have been obvious to one skilled in the art at the time of the invention to apply ultrasonic welding as taught by Pipitone to the combination made obvious by Lin '219, Lin '816 and Andert for the purpose of realizing the aforesaid advantage.

**13. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lin '219 in view of Lin '816 and further in view of Andert and further in view of Kizima (US Patent 5,670,932).**

14. Regarding Claim 5, as shown above apropos of Claim 1, the combination of Lin '219, Lin '816 and Andert makes obvious all elements except the disc being brass, stainless steel or nickel alloy. Kizima discloses a piezoelectric sounder (Fig.1b) with a nickel alloy metal vibrating plate 22 (column 3, lines 8-13). One skilled in the art would have known that such an arrangement provides durability and permits secure bonding and good electrical conductivity. It would have been obvious to one skilled in the art at the time of the invention to apply the nickel alloy metal vibrating plate as taught by Kizima to the combination made obvious by Lin '219, Lin '816 and Andert for the purpose of realizing the aforesaid advantages.

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15. **Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin '219 in view of Lin '816 and further in view of Andert and further in view of Martin (US Patent 4,494,032).**

16. Regarding Claim 9, as shown above apropos of Claim 1, the combination of Lin '219, Lin '816 and Andert makes obvious all elements except the piezoelectric element having a diameter of about 24 to about 26 mm. Martin discloses a piezoelectric transducer plate (Figs. 1-2, reference 1) with a piezo-ceramic plate 3 with a diameter of 25-35mm (column 2, lines 5-25). Martin further discloses that such an arrangement provides flexibility in application of the component (column 2, lines 53-57). It would have been obvious to one skilled in the art at the time of the invention to apply the piezo-ceramic plate diameter taught by Martin to the combination made obvious by Lin '219, Lin '816 and Andert for the purpose of realizing the aforesaid advantage.

17. Regarding Claim 10, as shown above apropos of Claim 1, the combination of Lin '219, Lin '816 and Andert makes obvious all elements except the piezoelectric element having a thickness of about 0.15 to about 0.25 mm. Martin discloses a piezoelectric transducer plate (Figs. 1-2, reference 1) with a piezo-ceramic plate 3 with a thickness of 50-150 microns (i.e., 0.05-0.15mm) (column 2, lines 5-25). Martin further discloses that such an arrangement provides flexibility in application of the component (column 2, lines 53-57). It would have been obvious to one skilled in the art at the time of the invention to apply the piezo-ceramic plate thickness taught by Martin to the combination made obvious by Lin '219, Lin '816 and Andert for the purpose of realizing the aforesaid advantage.

**18. Claims 12 through 15 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin '219 in view of Lin '816 and further in view of Andert and further in view of Massa (US Patent 4,190,784).**

19. Regarding Claim 12, as shown above apropos of Claim 1, the combination of Lin '219, Lin '816 and Andert makes obvious all elements except bonding portions for the wires formed on the same line around the center of the piezoelectric element. Massa discloses a piezoelectric transducer (Figs. 8-9) with electrodes (22, 23) that correspond to the bonding portions claimed on the same line around the center of the piezoelectric element (column 3, lines 52-55). Massa further discloses that such an arrangement permits convenient attachment of the leads (column 3, lines 60-64). It would have been obvious to one skilled in the art at the time of the invention to apply the electrodes taught by Massa to the combination made obvious by Lin '219, Lin '816 and Andert for the purpose of realizing the aforesaid advantage.

20. Regarding Claim 14, Massa does not disclose expressly bonding portions positioned. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to place the bonding portions 170 to 190 degrees from a passing hole. Applicant has not disclosed that placing the bonding portions 170 to 190 degrees from a passing hole provides an advantage, is used for a particular purpose, or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected applicant's invention to perform equally well with any arbitrary relative placement of bonding portions and passing hole because there is no interaction therebetween. Therefore, it would have been obvious to one of ordinary skill in the art to modify the combination made obvious by Lin '219, Lin '816 and Andert to obtain the claimed invention.



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21. All elements of Claim 13 are comprehended by Claim 14. As such, Claim 13 is rejected on the same grounds as Claim 14.

22. Regarding Claim 17, Massa further discloses the electrodes being surfaces (i.e., coatings) on the ceramic (column 3, lines 36-39).

23. All elements of Claim 15 are comprehended by Claim 17. As such, Claim 15 is rejected on the same grounds as Claim 17.

24. **Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lin '219 in view of Lin '816 and further in view of Andert and further in view of Massa and further in view of Berthold et al. (US Patent 5,196,754).**

25. Regarding Claim 16, as shown above apropos of Claim 15, the combination of Lin '219, Lin '816, Andert and Massa makes obvious all elements except bonding portions being UV coated. Berthold discloses a piezoelectric transducer (Fig. 2) with UV coating (column 3, lines 11-13). Berthold further discloses that such an arrangement provides mechanical stability and endures ultrasonic welding (column 3, lines 14-16). It would have been obvious to one skilled in the art at the time of the invention to apply the UV coating taught by Berthold to the combination made obvious by Lin '219, Lin '816, Andert and Massa for the purpose of realizing the aforesaid advantages.

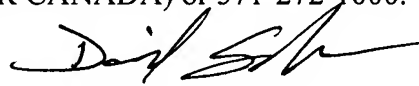
### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel Swerdlow whose telephone number is 571-272-7531. The examiner can normally be reached on Monday through Friday between 7:30 AM and 5:00 PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh H. Tran can be reached on 571-272-7564. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Daniel Swerdlow  
Primary Examiner  
Art Unit 2615

ds  
9-Jul-07